

Remarks

At the time of the Office Action dated July 17, 2006, claims 1-4 were pending in this application. In this Amendment, claims 1, 2, and 4 have been amended, claim 3 canceled, and new claims 5-7 added. Care has been exercised to avoid the introduction of new matter. Specifically, claim 1 has been amended to include the limitations recited in claims 2 and 3. Claim 2 has been amended for clarification, and claim 4 has been amended to be dependent on claim 1. Adequate descriptive support for new claims 5-7 should be apparent throughout the originally filed disclosure as, for example, the depicted embodiments and related discussion thereof in the written description of the specification.

Now, claims 1, 2, and 4-7 are active in this application, of which claims 1 and 5 are independent.

Specification

The disclosure has been objected to because of informalities. In response, the specification has been amended in a manner suggested by the Examiner. Withdrawal of the objection to the specification is respectfully solicited.

Claim Objections

Claim 3 has been objected to because of informalities. However, the objection to claim 3 has been rendered moot by cancellation of the claim. Withdrawal of the objection is, therefore, respectfully solicited.

Claims 3 and 4 have been rejected under 35 U.S.C. §112, second paragraph.

The Examiner asserted that claims 3 and 4 have antecedent basis issues. The amendment made to claim 4 addresses the issues identified by the Examiner. In addition, the amendment of claim 1 to incorporate the limitations of claim 3 has been made in consideration of the rejection of claim 3. Applicant, therefore, respectfully solicits withdrawal of the rejection of claims 3 and 4.

Claim 1 has been rejected under 35 U.S.C. §102(e) as being anticipated by Kurooka et al.

This rejection has been rendered moot by the amendment of claim 1 to include the limitations recited in claims 2 and 3. Applicant will discuss patentability of amended claim 1 below. Withdrawal of the rejection of claim 1 under 35 U.S.C. §102(e) is, therefore, respectfully solicited.

Claims 2-4 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Kurooka et al. in view of Ko et al.

Independent claim 1 includes the limitations recited in claims 2 and 3. Applicant will discuss differences between the subject matter of claim 1 and the applied combination of Kurooka et al. and Ko et al.

The Examiner asserted that Kurooka et al. teach an optical receiver including all the limitations recited in original claims 1 and 3, and Ko et al. teach a peak frequency of an optical receiver recited in original claim 2. However, Applicant submits that the applied combination of Kurooka et al. and Ko et al. does not teach an optical receiver including, among other things,

a first filter with a convex frequency response having a peak frequency to compensate the concave frequency response of the signal light, the first filter filtering the voltage signal from the current-to-voltage converter and outputting an electrical signal corresponding to the signal light; and

a control signal generator having a second filter and a divider, the second filter, which is a band-pass filter, receiving the voltage signal from the current-to-voltage converter to filter and outputting a filtered signal with a magnitude at a center frequency of the band pass filter, the divider outputting a control signal to the first filter by receiving the voltage signal from the current-to-voltage converter and the filtered signal from the second filter, the control signal being a ratio of the filtered signal to the voltage signal,

wherein the peak frequency of the first filter is varied by the control signal from the control signal generator.

In the statement of the rejection of claim 3, the Examiner asserted that Kurooka et al. teach, “peak frequency of the [band-pass] filter (51 in fig. 2) is varied by the control signal from the control signal generator (section 214 of block 21 in fig. 1 or control circuit 9 in fig. 1, page 6, para 0100)” (see the last paragraph bridging pages 5 and 6 of the Office Action).

Applicant invites the Examiner’s attention to the claimed first and second filters in claim 1 which requires the first filter to be controlled by the control signal from the control signal generator including the second filter (band-pass filter). According to the Examiner’s interpretation of original claims 1 and 3, and Kurooka et al., the Examiner identified Kurooka’s band-pass filter 51 as the claimed filter (now, first filter) (see paragraph 8 of the Office Action) and as the claimed band-pass filter (now, second filter) (see the paragraph bridging pages 5 and 6 of the Office Action).¹ However, claim 1, as amended, clearly requires two different filters, the first and second filters. The first filter is controlled by the control signal from the control signal generator including the second filter.

¹ See, also, the Examiner’s comments on the limitation “the filter” in line 10 of claim 3: “[f]or the purpose of examination, the limitation is examined as being referred to “band-pass filter” recited in claim 3 in lines 2, 4, 8.” Paragraph bridging pages 2 and 3 of the Office Action.

Accordingly, Kurooka et al. do not teach, at a minimum, the first and second filters in claim 1. Ko et al., simply describing a band-pass filter, do not cure the above deficiency of Kurooka et al.

Further, Applicant will discuss differences between the present invention and the applied combination of Kurooka et al. and Ko et al.

Kurooka's equalizer amplifier 5 shown in Fig. 2 includes a plurality of units comprising filter 51, phase shifter 52, and amplifier 53 connected in series with each other. Equalizer amplifier 5 superposes outputs from each unit after adjusting, independent of each unit, a frequency bandwidth of the filter, a shift magnitude in the phase shifter, and a gain of the amplifier to reproduce a signal transmitted on an optical path and distorted by the dispersion of the path. According to Fig. 1 of Kurooka et al., the amount of the adjustment in the bandwidth, the shift, and the gain are dynamically determined and controlled by a CPU which monitors the output of equalizer amplifier 5 to control it to be optimum.

Not only Kurooka et al. but also the present invention relate to a technique to re-produce the optical signal transmitted in a large dispersive optical path. However, Kurooka et al. require a plurality of units of the filter, the phase shifter, and amplifier. Without plural units, no effect for the reproduction of the dispersive signal may be accomplished in Kurooka et al., because Kurooka et al. inevitably require a large scale circuit.

On the other hand, the present invention accepts a dispersive signal having a concave frequency response, and compensates the dispersive signal in analog by a filter with a convex frequency response. The magnitude of the compensation is determined by merely comparing the magnitude of uncompensated signals within a predetermined range including the concave region to the magnitude of uncompensated signals in the whole range. In addition to the compensation

that is preformed in analog, the present invention accepts that the dispersion has the concave characteristic in a region, for example, between 2 to 4 GHz (see claim 2), which is distinguishable from a complicated dispersion that Kurooka et al. accept. Thus, the present invention can make the circuit configuration simple and small.

Ko et al. simply disclose a monolithic analog filter whose filtering characteristics may be dynamically varied. Even if the frequency bandwidth of the Ko's filter partly overlaps with that of the present invention, there is no motivation or suggestion that the Ko's monolithic active filter is to be utilized in the present invention. The passive filter of the present invention may fully satisfy the object of the present invention. No intention may be raised to use the monolithic active filter in the present optical receiver.

Based on the foregoing, Applicant submits that Kurooka et al. and Ko et al., either individually or in combination, do not teach an optical receiver including all the limitations recited in independent claim 1, as amended. Dependent claims 2 and 4 are also patentably distinguishable over Kurooka et al. and Ko et al. at least because these claims include all the limitations recited in independent claim 1. Applicant, therefore, respectfully solicits withdrawal of the rejection of the claims and favorable consideration thereof.

New Claims 5-7

Applicant believes that Kurooka et al. and Ko et al., either individually or in combination, do not disclose or suggest an optical receiver including all the limitations recited in new claims 5-7. Favorable consideration is respectfully solicited.

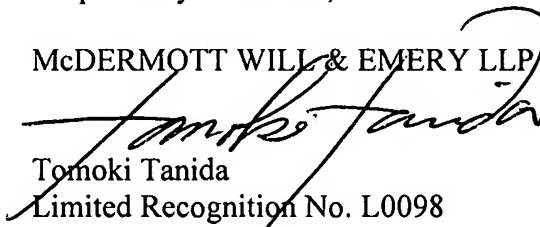
Conclusion

It should, therefore, be apparent that the imposed rejections have been overcome and that all pending claims are in condition for immediate allowance. Favorable consideration is, therefore, respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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